A Methodology to Evaluate the Effectiveness of Watershed-Scale Nonpoint Source Pollution Abatement Programs

Jill Neal
Environmental Engineer
Office of Research and Development, Water Supply & Water Resources Division
Water Quality Management Branch
(513) 569-7277
neal.jill@epa.gov

Key Words: best management practices (BMP), Clean Water Act (CWA), nonpoint source pollution, Safe Drinking Water Act (SDWA), source water protection

Authors: Jill Neal, James Goodrich (Office of Research and Development, National Risk Management Research Laboratory, Drinking Water Research); Eben Hobbins and Alan Vicory, (Ohio Valley Water Sanitation Commission); Richard G. Shamblen[1], Daniel V. Markowitz, and Jeffrey M. Lauria (Malcolm Pirnie, Inc., Columbus, Ohio)

Nonpoint source pollution is the leading cause of impairment to our nation's water resources. Both drinking and wastewater utilities are challenged to comply with existing and proposed federal Safe Drinking Water Act (SDWA) and Clean Water Act (CWA) regulations. Federal and state nonpoint source pollution abatement programs are available for communities to address impaired water resources. Because of the diffuse nature of nonpoint source pollution, it is difficult to identify specific sources of contamination that warrant restoration or protection. It is even harder for water utilities to affect behavioral changes of communities not being served by the utility. Collaborative partnerships enable water utilities to tap into pollution abatement incentive programs. However, many of these programs are competitive and require documentation that the programs are meeting intended water quality goals.

This poster presents a methodology and case study to evaluate the effectiveness of nonpoint pollution abatement programs. The methodology focuses on understanding and tracking changes in land management activities at the farm-field level. Model simulation results are aggregated in a geographic information system (GSI) technology and correlated with downstream water quality data maintained by the water utility. Elements of the methodology include: foster partnerships; information management systems; model evaluation and selection; characterize baseline conditions; and, program evaluation. The case study presents a source water protection program for the City of Columbus, Ohio (USA) where more than $1.5 million dollars of federal funding have been allocated to reduce atrazine runoff into the city's largest source of drinking water. Initial findings indicate that the nonpoint source pollution abatement program does reduce atrazine runoff into the city's water supply.

Results of this project will provide a national methodology demonstrating how watershed organizations can characterize water quality concerns, select appropriate BMPs and evaluate the effectiveness of restoration efforts at the field and watershed scales. This methodology can be applied to source water protection, stormwater, and total maximum daily load programs.

[1] Corresponding author.